



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Siepel et al.

Examiner: Tran, Lien

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For: INGREDIENTS FOR
EXPANDED FOODS

Date: August 16, 2004

Commissioner for Patents
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DECLARATION UNDER 37 C.F.R. § 1.132

The undersigned, Pieter L. Buwalda of Mondriaanstraat 32, Groningen, the Netherlands, herewith declares as follows:

1. I am a Food Starch Specialist at the Food Competence Center of the international co-operative AVEBE in Foxhol, The Netherlands, the world's largest manufacturers of potato starch derivatives. I took up this position on December 1 of 2001. Before that I was associated with the Chemistry Department of AVEBE for a period of almost twelve years where I performed research on various starch applications, the last five years mainly food oriented. My specialisation is Chemistry of Starch.

I hold a PhD degree in Organic Chemistry from the University of Groningen, the Netherlands, and have written a number of publications and am a co-inventor of various patents relating to Starch Chemistry. In 1997, for instance, I acted as an author on Granular and Molecular Structure of Starch, The 3rd CAFST International Symposium, page 109. A list of publications is attached to this declaration.

2. I am co-inventor of the patent application as identified above. The invention of this application is based on the insight that a foodstuff that is prepared with the use of an amylopectin root/tuber starch in a process involving heating to a temperature above the glass transition temperature of the starch exhibits unexpectedly high expansion as compared to a similar foodstuff prepared from regular (i.e. amylose containing) potato starch or amylopectin maize starch (waxy maize). A foodstuff prepared with such a starch moreover has an advantageous texture.

3. Based on experimental evidence, the method disclosed by van Hulle et al. does not result in a foodstuff with the beneficial properties and characteristics of the foodstuffs prepared by a method of the present invention. In particular, the desired expansion properties will not be obtained.

In the procedure described by van Hulle et al., cold water soluble (hereinafter pregelatinized) starch is used to modify the rheology of the product in water rich dough. The dough is cooked in an extruder under pressure. The dough is then dried. The air bubbles entrapped in this system give the airy texture. This can be compared to the baking of a cake or aerated cookies in traditional baking applications. In this prior art procedure, the pregelatinized starch merely serves as a rheology modifier of the dough.

In contrast to the van Hulle et al. procedure, in accordance with the present invention, both non-pregelatinized and pregelatinized, non-cereal starch having an amylopectin content of at least 90 wt.% may be used to enhance the airy texture. Before frying or baking, the initial dough composition is usually non-aerated and glassy, similar to a pasta noodle. Starting from a low moisture system, the dough composition is then heated above the glass transition temperature and exposed to vigorous blowing of water.

Thus, in contrast to the procedure of van Hulle et al., in a process of the present invention, expansion is not realized in the initial dough composition; instead expansion takes place during heating, i.e. during frying or baking.

4. Furthermore the present invention requires expansion of a product using a non-cereal amylopectin starch, which results in a higher expansion than when waxy maize is used. Jeffcoat et al. show that amylopectin potato starch derivatives are much higher in viscosity than waxy maize derivatives (see col. 2, lines 30-35 and 43-48, as well as Fig. 1 and Tables II and III). It is generally understood to those skilled in the art that expansion is inversely related to viscosity (the higher the viscosity, the lower the expansion).

Therefore, it would be expected that application of an amylopectin potato starch as disclosed by Jeffcoat et al. in the procedure of van Hulle et al. would lead to reduced expansion when compared to waxy maize starch or regular potato starch.

5. The Examples of the present application, which were carried out in 1998 under my supervision, reflect the superior expansion characteristics of a foodstuff prepared in a process of the invention in comparison with a foodstuff prepared using regular potato starch or waxy maize starch (see Tables 1 and 2). In particular, Table 1 shows that the product prepared in Example 1, using native regular potato and pregelatinized waxy maize starch, shows an expansion rated a 6, whereas the product prepared in Example 4, using native amylopectin potato starch and a pregelatinized amylopectin potato starch, shows an expansion rated an 8.

The results of more detailed expansion measurements are shown in Table 2. These measurements were performed by weighing the amount necessary to fill a 2 liter measuring cylinder with baked snacks prepared as described in Examples 5-11. The results are expressed as the volume occupied by 200 grams of snacks. As can be seen in Table 2, 200 grams of the snacks prepared in Examples 5 and 8-9¹, prepared using amylopectin potato starch, all occupy 2100 milliliters or more; whereas 200 grams of the snacks prepared in Examples 6 and 7, prepared using waxy maize starch and regular, amylose containing potato starch, respectively, occupy only 1880 and 1610 milliliters, respectively. In the worst case (i.e. comparing the results for waxy maize of Example 6 with those for amylopectin potato starch in Example 9), this still is an increase in expansion of more than 15%.

¹ Examples 10 and 11 should not be taken into account in this comparison because different recipes were used for preparing the snacks in these Examples. In particular, in Example 10 the starch dosage was increased by 50% and in Example 11 the water dosage was increased by 40%.

6. There is a typographical error on page 8, lines 22-27, of the instant specification (Example 1). The amount of the starch mixture in line 27 should read 600 grams (400 grams of native and 200 grams of pregelatinized starch) instead of 400 grams.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true. Further that these statements were made with the knowledge that willfully false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willfully false statements may jeopardize the validity of the application of any patent issued thereon.

Dated: 30/8/2004

Respectfully submitted,



Pieter L. Buwalda